

**STATE OF ILLINOIS  
ILLINOIS COMMERCE COMMISSION**

AMEREN TRANSMISSION COMPANY OF ILLINOIS	)	
	)	
Petition for a Certificate of Public Convenience and	)	
Necessity, pursuant to Section 8-406.1 of the Illinois	)	
Public Utilities Act, and an Order pursuant to Section 8-	)	Docket No. 12-0598
503 of the Public Utilities Act, to Construct, Operate and	)	
Maintain a New High Voltage Electric Service Line and	)	
Related Facilities in the Counties of Adams, Brown,	)	
Cass, Champaign, Christian, Clark, Coles, Edgar, Fulton,	)	
Macon, Montgomery, Morgan, Moultrie, Pike,	)	
Sangamon, Schuyler, Scott and Shelby, Illinois.	)	

**TESTIMONY OF CHARLES E. ELLIS ON BEHALF OF JDL BROADCASTING, INC.**

**Direct Testimony of Charles E. Ellis**

**On Behalf of**

**JDL Broadcasting, Inc.**

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3 **Q. What is your name?**

4 **A.** My name is Charles F. Ellis.

5 **Q. Please describe your educational background.**

6 **A.** I graduated from the Florida State University in 1970 with a Bachelor of Arts Degree in  
7 Physics and Mathematics. I received a Bachelor of Science Degree in Electrical Engineering  
8 from the University of Southwestern Louisiana in 1978.

9 **Q. Do you hold any professional licenses or certificates?**

10 **A.** Yes, sir. I am a Registered Professional Engineer licensed in the State of Louisiana.

11 **Q. By whom are you employed?**

12 **A.** I own and perform services for Ellis Engineering, which is a consulting electrical  
13 engineering firm based in Lafayette, Louisiana. In addition, I am a contractual employee of D.L.  
14 Markley & Associates. My services in this engagement were on behalf of D.L. Markley &  
15 Associates.

16 **Q. What type of professional services do you provide?**

17 **A.** Among others, I provide consulting engineering services that include design,  
18 construction, supervision and assistance with government applications to commercial AM and  
19 FM radio facilities, analog and digital TV and LPTV facilities and private wireless services,  
20 including paging, trunking, two-way, cellular and SCADA facilities.

21 **Q. Is the document attached to this testimony as JDL Exhibit 2.1 a copy of your**  
22 **current resume?**

23 **A.** Yes, except that it does not indicate that I also provide engineering consulting services  
24 through D.L. Markley & Associates.

25 **Q. What is the purpose of your testimony?**

26 **A.** I was retained by D.L. Markley & Associates to provides services to JDL Broadcasting,  
27 Inc. to identify and evaluate any risks posed to JDL Broadcasting by the proposed location of the  
28 centerline of ATXI's 345kV transmission line on ATXI's Primary Route in Clark County,  
29 Illinois. JDL Broadcasting owns and operates an FM station known as WMMC-FM. The  
30 WMMC tower upon which WMMC relies to broadcast its signal appears to be located  
31 approximately 220 feet from the centerline of the proposed 345 kV transmission line.  
32 Furthermore, the outer guy wire on the northeast side appears to be located approximately five  
33 feet inside the proposed easement for ATXI's proposed 345kV transmission line, and the anchor  
34 for the guy wire extends another seven and a half feet underground further into the proposed  
35 easement area. In addition, the fence guarding access to the guy wire and anchor appears to be  
36 within the proposed easement area.

37 **Q. Do you have any specialized expertise with respect to the design and operation of**  
38 **FM radio stations?**

39 **A.** Yes. With the exception of time when I was in school and a couple of years when I  
40 taught school, I have worked continuously in and with the FM radio industry for almost fifty  
41 years. I have owned and operated FM radio stations; I have designed FM radio stations; I have  
42 supervised the construction of FM radio stations; I have designed and constructed transmitting  
43 facilities for FM radio stations; I have maintained FM radio stations; and I have routinely been

44 consulted on coverage and potential transmission interference problems relating to FM radio  
45 stations.

46 **Q. Did you identify any potential problems with the proposed location of the 345 kV**  
47 **transmission line so close to the WMMC tower?**

48 **A.** Yes, I did.

49 **Q. Did you prepare an analysis of the potential problems that you identified?**

50 **A.** Yes, I did.

51 **Q. Is the document entitled “Effects of the Ameren High Voltage Power Line on the**  
52 **WMMC Transmitting Facility” attached to your testimony as JDL Ex. 2.2 a copy of the**  
53 **report that you prepared for JDL Broadcasting in which you documented your analysis**  
54 **and conclusions?**

55 **A.** Yes, it is.

56 **Q. Could you please briefly describe the problems that you identified and analyzed?**

57 **A.** Well, the first one is an obvious one. You would have a 500 foot radio tower located  
58 approximately 220 feet from a 345 kV high voltage transmission line. As discussed in the  
59 Testimony of Lori Spangler that is marked JDL Broadcasting Ex. 1.0, there are several reports  
60 available on the internet that document a rather extensive list of catastrophic failures of broadcast  
61 towers and their causes. See

62 [http://en.wikipedia.org/wiki/list\\_of\\_catastrophic\\_collapses\\_of\\_broadcastmasts\\_and-Towers;](http://en.wikipedia.org/wiki/list_of_catastrophic_collapses_of_broadcastmasts_and-Towers;)  
63 [www.sbe.org/sections/documents/TOWERFAILURES.pdf](http://www.sbe.org/sections/documents/TOWERFAILURES.pdf). Broadcast towers can and do fall. If  
64 the 500 foot WMMC tower were to fall on the ATXI 345 kV transmission line, it could have  
65 potentially disastrous consequences. Second, radio frequency radiation from the 345 kV  
66 transmission line could cause interference with WMMC’s broadcast signal. Third, electric and

67 magnetic fields generated by the 345kV line likely will induce voltages and current in the tower,  
68 guy wires, anchors and transmitter building, possibly causing advanced deterioration and raising  
69 safety concerns for tower workers. Fourth, the guy wires supporting the tower already are closer  
70 to the tower than normal. If the guy wires cannot be effectively relocated to support the tower,  
71 or if there is too much interference with WMMC's signal, it likely will be very difficult for  
72 WMMC to relocate and the move certainly will be costly. Finally, while I do not expect it to  
73 happen, it is possible that WMMC could experience broadcast difficulties if the WMMC  
74 microwave path was obstructed by a support tower for the 345 kV transmission line.

75 **Q. Please explain your concern about radio frequency radiation potentially interfering**  
76 **with sensitive FM broadcast equipment.**

77 **A.** Radio frequency radiation could result from arcing or corona discharge. Arcing is the  
78 result of electricity moving through a normally nonconductive surface, such as air. Corona  
79 discharge is defined in Wikipedia as "the electrical discharge brought on by the ionization of a  
80 fluid surrounding a conductor that is electrically energized."  
81 [http://en.wikipedia.org/wiki/Corona\\_discharge](http://en.wikipedia.org/wiki/Corona_discharge). It frequently is associated with a bright blue  
82 light, and can be the result of worn insulation, loose bolts or cracked or chipped insulators. It is  
83 not uncommon for transmission lines of this size to have these sorts of maintenance issues.  
84 EPRI AC Transmission Line Reference Book – 200 kV and Above, at Chapter 8, pages 8-1 to 8-  
85 40, and Chapter 9, pages 9-1 to 9-74 (3d ed.) The WMMC transmitter building at the base of that  
86 tower contains sensitive electronic equipment, including microwave receivers, FM transmitters,  
87 and audio equipment. Any arcing or corona discharge in the transmission line at its proposed  
88 location approximately 220 feet from the WMMC Tower very likely will cause radio  
89 transmission interference, and disrupt WMMC's broadcast signal.

**Q. Please explain your concern about induced voltages and currents in the tower, guy wires and transmitter building.**

**A.** As explained in more detail in my attached report, and as documented in Electric Power Research Institute AC Transmission Line Reference Book-200kV and Above (3d Ed.), the closer one is to the extra high voltage transmission line, the greater both the electrical and magnetic fields are. (The Electric Power Research Institute is a not-for-profit research organization funded by the electric utility industry). Strong magnetic fields and strong electric fields cause induced currents and voltage in nearby conductive surfaces. Given the proximity of the proposed 345 kV line to the tower, guy wires, anchors and transmitter building, and the conductive loop formed by the tower, guy wires and ground, I think it is more likely than not that voltage and current will be induced by the electric field, the magnetic field, or some combination of both, in the tower, guy wires and possibly the transmitter building. This could cause arcing and advanced deterioration of the tower, FM coaxial cable, fittings, and anchors. Tower crews could also find that their metal tools arc when working on the tower or guy wire structures.

**Q. Can you quantify the risk or likely cost to JDL Broadcasting to address these issues?**

**A.** No.

**Q. Why not?**

**A.** Given the limited resources and limited information about the location, design and operation of the proposed 345 kV transmission line, I cannot quantify the risk, predict the accelerated deterioration or describe with certainty the costs to design or develop measures to mitigate or control the problem. I can tell you that induced current and voltage in the tower and guy wires is likely and an issue that warrants careful study and analysis.

113 **Q. Please tell us about the possibility of interference with the WMMC's microwave**  
114 **path?**

115 **A.** It is possible, depending upon the placement of the proposed 345 kV power line support  
116 structures, that the structures could block the microwave path between the studio and the  
117 transmitter station. It is unlikely, because the microwave signal should be able to flow around a  
118 limited physical impediment, but it is a potential problem.

119 **Q. Have you evaluated the consequences to JDL Broadcasting if it were required to**  
120 **relocate its tower?**

121 **A.** Yes, I have.

122 **Q. What would cause JDL Broadcasting to have to relocate the WMMC tower?**

123 **A.** If the potential sources for interference that I have described above become a significant  
124 problem, JDL Broadcasting obviously would have to consider moving its tower. Listeners and  
125 advertisers do not tolerate frequent signal disruption. The other potential cause would be if the  
126 WMMC tower guy wires could not be relocated. I know that the current distance of the guy  
127 wires from the tower is less than normally recommended. I am not a structural engineer, and I  
128 have not evaluated whether the guy wires can be moved out of the proposed ATXI easement and  
129 closer to the tower without compromising the structural integrity of the tower. If that were to  
130 occur, then JDL Broadcasting either would have to relocate the tower or replace it with a self-  
131 supporting tower.

132 **Q. Can the tower be relocated?**

133 **A.** It very likely would be impossible to relocate the tower and keep the present WMMC  
134 operating parameters, and it certainly would be costly to do so.

135 **Q. Why is it your opinion that it very likely would not be possible to relocate the tower?**

136 **A.** As explained in greater detail in my attached report, under the governing Federal  
137 Communications Commission (“FCC”) rules, WMMC must cover the city of license, Marshall,  
138 with a city grade signal, while at the same time maintaining minimum distances to other affected  
139 radio stations. It is practically impossible to relocate the tower, and satisfy the governing FCC  
140 requirements, while maintaining the same parameters, such as antenna pattern, tower height, and  
141 power output.

142 **Q. Why would it be expensive to relocate the WMMC tower?**

143 **A.** The attached report goes into greater detail about this issue. Basically, the FCC has  
144 traditional technical specifications and allotment criteria that make the allocation of an FM  
145 station difficult. Those include spacing requirements, power requirements, height of antenna  
146 requirements, city of license coverage requirements and a number of other criteria. In addition,  
147 the FCC recently has imposed a requirement that a new tower structure over 400 feet must be  
148 supported by an environmental assessment, which requires an extraordinarily detailed study and  
149 coordination with multiple federal resource agencies.

150 **Q. Is there anything else you would like to add?**

151 **A.** Given the safety hazard and potential significant negative impacts that I have described in  
152 my testimony and report, it makes little sense to site a 345 kV transmission line this close to an  
153 FM radio tower and transmitting facility. I have never encountered a similar situation in my  
154 almost fifty years in the broadcast industry. If there is another prudent and feasible alternative  
155 location, I hope that ATXI would utilize that route instead of the one that passes so close to the  
156 WMMC tower.

157 **Q. Does this conclude your testimony?**

158 **A.** Yes, it does.